NextGen Weather Drivers

- Weather accounts for
 - 70% of delays
 - 21% of accidents
- Demand will triple by 2025
- Demand exceeds capacity in weather
- Impacts both airborne and surface user
- New approaches are necessary to safely accommodate demand
 - Better weather information
 - NEO
 - Increased use of automated decision tools
 - Better use of better weather information



2025 NextGen Concept

Operating Principles

- "It's about the users..."
- System-wide transformation
- Prognostic approach to safety assessment
- Globally harmonized
- Environmentally compatible to enable continued growth

Key Capabilities

- Net-Enabled Information Access
- Performance-Based Services
- Weather-Assimilated Decision Making
- Layered, Adaptive Security
- Broad-Area Precision Navigation
- Trajectory-Based Aircraft Operations
- "Equivalent Visual" Operations
- "Super Density" Operations





NextGen Network Enabled Weather

- 4D Weather Data Cube
- System Wide Application
- Single Authoritative Source
- Increased Machine-to-Machine Operations
- Deterministic and Probabilistic information
- Increased user access to all relevant data
- Integration into user applications and decisions
- Achieve cost efficiencies for operations



Thrust 1 -Integration

- Major objectives
 - Consolidate weather information into decision support tools, automation systems, avionics
 - Incorporate probabilistic forecasts into ATM decisions
 - Measure impact of weather information on operations
 - Update weather regulations
 - Develop user training
- What will be delivered
 - Improved, probabilistic weather information tailored to support NextGen Decision Support Tools (DST)
- Benefits
 - Increased capacity for traffic reroutes, runway reconfigurations, gate assignments, metering and spacing



Thrust 2 - Dissemination

- Major objectives
 - Provide common and widely accessible weather data and impact information using Network Enabled Operations methods
 - Implement NEO network governance
 - Set standards for core services
 - Develop solutions for multi-agency information security
 & Quality Assurance
- What will be delivered
 - NEO weather architecture that facilitates access by all users to real-time and strategic weather information
- Benefits
 - FAA cost avoidance
 - Increased capacity



Thrust 3 - Forecasts

- Major objectives
 - Provide weather processing to support operations.
 - Develop consolidated product suites to support ATM decision making
 - Support development of the 4-D Weather Data Cube
 - Translate weather algorithms into NEO compatible formats
- What will be delivered
 - Improved deterministic and probabilistic forecasts of all aviation relevant weather phenomena
- Benefits
 - Longer planning horizon
 - Increased certainty and lead time for operational decision making



Thrust 4 - Observations

- Major objectives
 - Develop & optimize airborne sensors networks
 - Consolidate ground sensor networks
- What will be delivered
 - Right-sized aviation observation suite of real-time and strategic weather information
- Benefits
 - Cost efficiency
 - Improved tactical and strategic decisions
 - Increased hazard avoidance



NextGen Weather Concepts



Ken Leonard Chief, ATO-P Weather Office

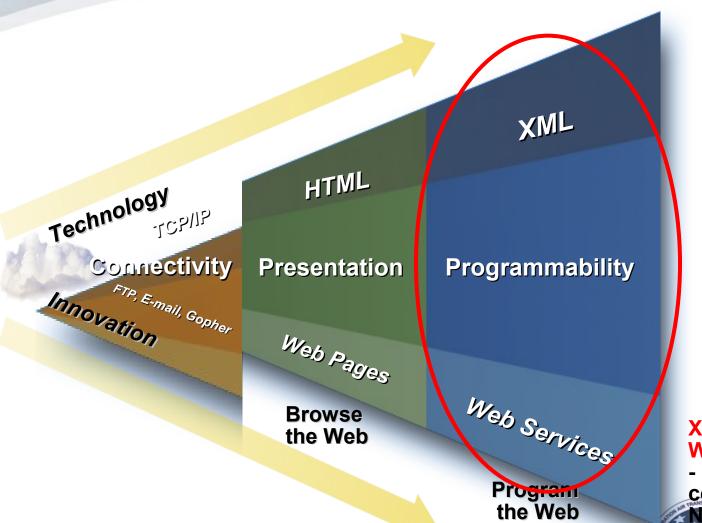
Steve Brown Industry Co-Chair, WWG

Feb 12th, 2008





Network Services Evolution of Transportation System Office Services



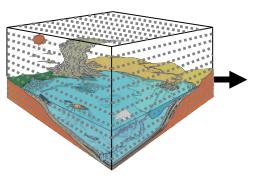
XML and Web Services

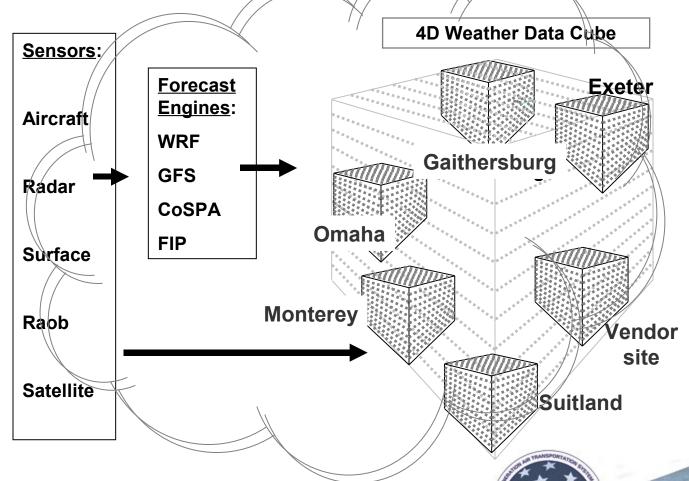
- Fundamental construct for Net-Centric applications

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NNEW and the 4D Weather Data Cube







Draft Weather Integration "Roadmap"

2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2008 2009 **Full Integration of NextGen Weather Weather Information into NextGen Weather Decision Support Tools NextGen Operational NextGen Weather** Information **And Proactive Weather Decisions Information Concepts Initial Capability Decision Making Build Initial 4D** Align Agency Optimize/Integrate Manage/Enable Policy and Resources Weather System ·Identify, align, or eliminate Develop and implement Weather Information sharing Common situational awareness for all users of the NextGen. duplicative weather research weather information sources and products with decision System, promoting both improved system capacity and safety and acquisition programs protocols and standards tools are the core of a layered. (FAA, DOC, DOD) (FAA, NASA, DOC, DOD) risk-based operations approach (FAA, DOC, DOD) (FAA, NASA) Streamlined weather information architecture reduces Redirect existing research Design and Acquire 4D operations and maintenance costs for both government and Weather Infrastructure Weather Event Information is well users (FAA, DOC, DOD) programs towards implementation of a national (FAA, DOC, DOD) characterized & consistently weather information collection passed across organizational / •Direct integration of weather information and decision support agency boundaries (FAA, NASA, tools ensure NextGen is supported by both NextGen relevant and dissemination capability Migrate legacy weather (FAA, NASA, DOC, DOD) weather data and "weather savvy" decision support automation DOC. DOD) systems towards 4D CONOPS (FAA) (FAA, NASA, DOD) Stand up interagency •4D trajectories are enabled and program "4D" weather routinely updated through the use Develop and implement •Informs decision makers of options, assists in the automated program office (FAA, DOC, technologies to populate of integrated weather information identification of potential decision risks, and poses suggested DOD) weather information (FAA.NASA) operational solutions along with projections of NextGen impacts system under "Single (FAA, NASA, DOD) Authoritative Source" Revisit and update decades old weather operational concept (FAA, DOC, policies (FAA) DOD) Direct & implement Synchronize existing **Transform operational** Risk based decision making, supported by agency-wide policy, and planned future system weather decision governance, standards and information sharing measures with continuous agency and industry solutions for NextGen feedback loops making processes

efforts

Weather Information

Aviation Weather Office Functions

- Coordinate Nextgen weather strategic planning
- Document policy and requirements
- Conduct aviation weather research
- Develop new capabilities
- Complete test & evaluations
- Provide Legacy support & transition
- Define, evaluate and verify weather capability effectiveness



Aviation Weather Office Objectives

- Coordinate planning activities
- Define aviation weather requirements
- Clarify the value chain
- Achieve measurable benefits
- Determine acquisition strategy and policy
- Align aviation weather research, development and implementation
- Plan weather capability integration
- Develop Nextgen capabilities



Thoughts to Take Away

Because of the

dynamic nature of weather, its impact on congested operations, and the complexity of user decision making;

We must establish a weather information infrastructure and utilize decision tools and automation into which weather information is fully integrated